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The problem of the concentrating action of magnetic forces and the diverging action of electric forces (page 85) is not set forth sufficiently clearly. It would have been appropriate to have considered the results obtained in studying and explaining the focusing of an electron beam in a betatron, a synchrotron, and other accelerators.

Pages 91-101 give a good qualitative and quantitative account of phenomena distorting an oscillograph trace.

The photographic action of a cathode ray and oscillographic methods are explained on pages 107-132. The physicochemical principles of the photographic action of the electron beam are explained in detail, giving the numerical characteristics of the materials used and methods of making oscillograms, both in vacuo and with external devices. The author determines the depth of electron penetration into a layer of a substance from Thomson's formula. This formula was deduced for determining the speed lost by electrons when passing through a substance. In this case it would have been better to use formulas for estimating the limiting depth of penetration of electrons travelling at high speeds.

In the second chapter, "Designs of Cold-Cathode Oscillographs," the author systematizes and classifies the extensive material on this problem. Here are discussed some basic types of oscillographs and their principal units and elements. The more successful designs are described, and also the methods used in solving various problems.

The statement (on page 155), that controlling a photo-adaptor by means of an electromagnet from the outside is less reliable and more complicated than using slides, is doubtful.

Although there is a fairly detailed description of cold-cathode oscillographs and their classification on pages 161-180, the general principles of their design are inadequately stated and described.

Hot-cathode oscillographs are described in the third chapter. Considerable space is devoted to a description of electron beams. The book describes the electric fields of various electron-optical systems, which astound the reader with their complexity. It should have been stated in greater detail that electric fields are ordinarily studied on models, e.g., by the electrolytic bath method. It would also have been pertinent to refer to the Stalin Prize-winning theoretical work of Prof G. A. Grinberg, who devised theoretical methods of calculation, making it possible to select the shape of the electrodes to obtain a field of the required configuration.

The fourth chapter, "Elements of Oscillographic Circuits," examines the features of operation of the individual elements of these circuits (cathode tube, thyatron, spherical gaps, etc.) and also the work of circuit components (electronic switches, relays, time development circuits, voltage dividers, voltage amplifiers, etc.). (Note: Part of the review examining this chapter was compiled with the assistance of Engr V. S. Melikhov).

The action of these elements is described in sufficient detail. More space is given to an examination of the work of spherical dischargers, three-electrode relays, and also circuits including these elements; this is justified by the fact that in many cases spherical dischargers considerably simplify circuits for taking oscillographs of high-voltage pulse phenomena. Everything that relates to these circuits is described in great detail, in clear precise language, and a considerable amount of experimental data is given.

Much space is also assigned to schemes with electronic and ionic instruments without which it is impossible to construct modern electrical oscillograph circuits. There are errors in the presentation of this material. Thus, in the paragraph "Katodnaya lampa" (cathode tube) this electronic instrument is termed alternately "lampa"

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or "trubka." The latter term usually refers to the cathode-ray tube and should not be applied to an electron tube, especially as electron-ray tubes exist (6L6). On page 224 the term "thyatron terminals" is used. As is well known, thyatrons have no terminals but they do have electrodes. [Reviewer seems to go out of his way to point out other minor errors of this type which have been omitted here for the sake of brevity.]

The DC amplifier circuits given on pages 326-328 are much too complicated and the tubes used are in short supply; with two amplification stages, the circuit given contains seven tubes, not counting the kenotrons. Three or four tubes and glow-discharge voltage stabilizers are sufficient to obtain the necessary stability with this number of amplification stages.

The fifth chapter analyses the electrical circuits in which oscillographs are connected. A very large amount of well-known material has been suitably classified by the author. Circuits are given for connecting cold- and hot-cathode oscillographs. Activating circuits and pulse-action circuits are described at length. Much space is devoted to experiments using original circuits. Special attention is devoted to pulse circuits. This allocation of material is to be approved, in view of the present-day development of pulse techniques.

The sixth chapter gives some concrete examples of the use of electronic oscillographs in engineering. These examples, in addition to those in the fifth chapter, provide sufficient proof of the wide possibilities of the instrument.

On the whole the book is readable. The author expresses himself clearly, using the rich vocabulary of the Russian language. Consequently, isolated poor sentences leap to the eye all the more, e.g., on pages 191, 197, 205, 211, and 220.

In conclusion, let us note once more that, in general, the book is a good one. In view of the enormous material which has accumulated on the use of the oscillograph, it is suggested that the next edition should comprise two books: the first on the use of the oscillograph for studying stationary and periodic phenomena, the other on its use in pulse technology.

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